

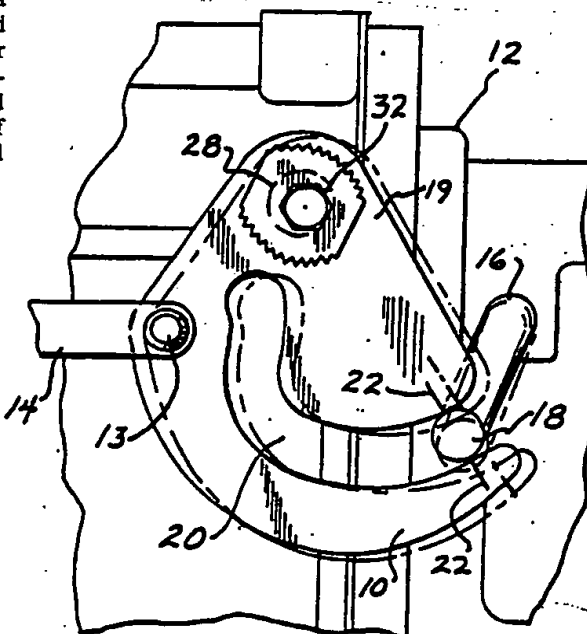


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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**(54) Title:** CAM ADJUSTMENT ASSEMBLY**(57) Abstract**

An adjustment assembly for a throttle cam (10) includes a mounting area (19) on the throttle cam in which a hole is provided. A cam adjustment means (24) is provided which includes a base plate (26) in a cylindrical shoulder (28) extending from the base plate with the throttle cam being mounted on the shoulder. The shoulder is provided with an eccentrically located hole (30) so that rotation of the cam adjustment means results in both horizontal and vertical movement of the cam.



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## CAM ADJUSTMENT ASSEMBLY

This invention relates to a cam adjustment assembly and more particularly to an assembly that allows for proper, vertical and horizontal alignment of a throttle cam with its associated pickup lever.

5 In a variety of marine propulsion units and in particular marine outboard engines, a pivoting throttle cam engages a throttle pickup lever and the movement of the throttle cam by a throttle link rod causes associated movement of the throttle pickup  
10 lever which in turn varies the throttle opening in the propulsion unit.

During assembly and/or timing adjustments it is necessary to align an indicator line on the throttle cam with the throttle cam follower on the  
15 throttle pickup lever.

In the past, this was done by removing the end of the throttle link rod from the throttle cam and then loosening the mounting means on the throttle cam and moving the throttle cam within an elongated  
20 horizontal mounting slot. In order to provide vertical adjustment for the throttle cam it was necessary to loosen the mounting of the carburetor on which the throttle cam was mounted and move the carburetor on its mounting screws. Thus, horizontal adjustment  
25 required the removal of the throttle link rod and vertical adjustment required actual movement of the carburetor.

The present invention provides an adjustment assembly to provide proper vertical and horizontal  
30 alignment between a throttle cam and its associated pickup lever, said assembly comprising; a mounting

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area on the throttle cam, rotatable cam adjustment means disposed within a hole in said mounting area and providing an eccentric surface on which the throttle cam rides, mounting means for releasably securing the throttle cam to an adjacent stationary structure whereby rotation of said adjustment means results in vertical and horizontal movement of the throttle cam.

With the present throttle cam adjustment assembly it is necessary only to loosen one mounting bolt. After loosening the mounting bolt, a cam adjuster is rotated and the eccentric shape of the cam adjuster allows for vertical and horizontal movement of the throttle cam.

Thus, the present invention greatly simplifies the procedure for adjusting both the vertical and horizontal position of the throttle cam.

In the drawings:

Figure 1 is a side elevational view of a throttle cam and its associated throttle pickup lever with the throttle cam mounted on a cam adjuster and with phantom lines indicating alternate positions;

Figure 2 is an enlarged side view of the mounting of the cam on the cam adjuster with phantom lines indicating an alternate position;

Figure 3 is a sectional view taken along the line 3-3 in Figure 2; and

Figure 4 is a rear view of the cam adjuster.

As seen in Figure 1, a throttle cam 10 is mounted on the casing of a carburetor 12. A throttle link rod 14 is connected to pin 13 on throttle cam 10 and translates movement of a throttle control (not shown) into pivotal movement of throttle cam 10. The pivotal movement of throttle cam 10 results in movement of throttle pickup lever 16 caused by the movement of roller 18 within the curved slot 20 of cam 10.

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As throttle pickup lever 16 moves, the throttle opening within carburetor 12 is varied.

During assembly and/or timing adjustments it is necessary to align etched indicator lines 22 with the approximate center of roller 18. This alignment assures proper timing between the spark advance and the throttle opening in the carburetor. In order to facilitate this alignment procedure, throttle cam 10 is provided with a hole in upper mounting area 19 and is mounted on carburetor body 12 by means of a cam adjuster 24. Cam adjuster 24 includes a base portion 26 and a cylindrical shoulder 28 that extends outwardly from base 26 and includes an eccentrically located hole 30. A screw 32 or other mounting device is inserted through hole 30 and releasably secures throttle cam 10 and cam adjuster 24 to carburetor body 12. Figure 3 also shows the use of a spacer 33. However, the use of such a device is not required by the invention.

20 In order to vertically or horizontally adjust the position of throttle cam 10, screw 32 is loosened so as to allow rotational movement of cam adjuster 24. A tool such as a wrench can be applied to the flats 34 on the circumference of cam adjuster 24 or cam adjuster 24 can be rotated manually. To facilitate manual rotation of cam adjuster 24, a series of serrations 36 are provided about the circumference of cam adjuster 24. Due to the eccentricity of the position of hole 30, rotational movement of 30 cam adjuster 24 results in both a vertical and horizontal movement of throttle cam 10. Thus, the position of indicator lines 22 may be varied slightly in both a vertical and horizontal plane in order to bring them into proper alignment with the center of 35 roller 18. The variation in position of cam adjuster

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24 and the resulting variation in the position of throttle cam 10 is best shown in phantom in Figure 2.

Thus, the vertical and horizontal position of throttle cam 10 and its associated indicator lines 5 22 may be adjusted by merely loosening screw 32 and rotating cam adjuster 24.

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CLAIMS

1. An adjustment assembly to provide proper vertical and horizontal alignment between a throttle cam (10) and an associated pickup lever (16) said assembly comprising: a mounting area (19) on the throttle cam, rotatable cam adjustment means (24) disposed within a hole in said mounting area and providing an eccentric surface (28) on which the throttle cam rides, mounting means (32) for releasably securing the throttle cam to an adjacent stationary structure (12) whereby rotation of said adjustment means results in vertical and horizontal movement of the throttle cam.

2. The adjustment assembly of claim 1, wherein said cam adjustment means (24) comprises; a base plate (26) and a cylindrical shoulder (28) extending from said base plate and having a diameter substantially equal to that of said hole in said mounting area, the throttle cam (10) being mounted on said shoulder with said shoulder provided with an eccentrically located hole (30) through which said mounting means passes.

3. The cam adjustment assembly of claim 2, wherein said base plate (26) is provided with at least a pair of flat surfaces (34) about its circumference for engagement by a tool for rotation of the cam adjustment means.

4. The cam adjustment assembly of claim 2, wherein said base plate (26) is provided with a frictionally enhanced surface (36) along its circumference to facilitate manual rotation of said cam adjustment means.

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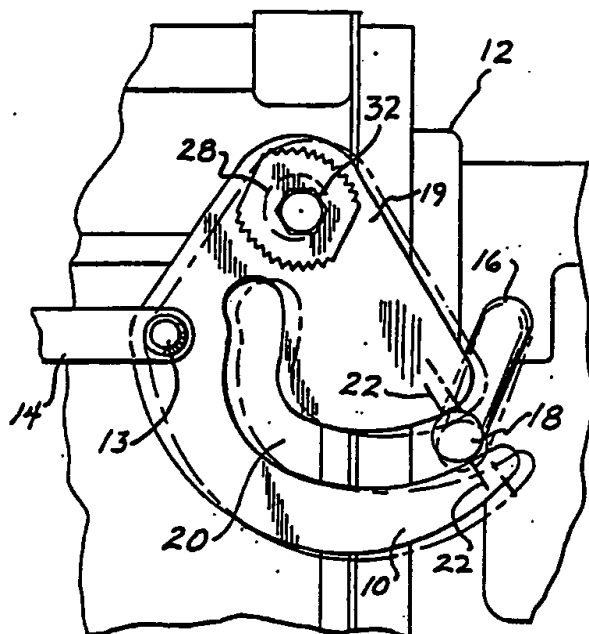


FIG. 1

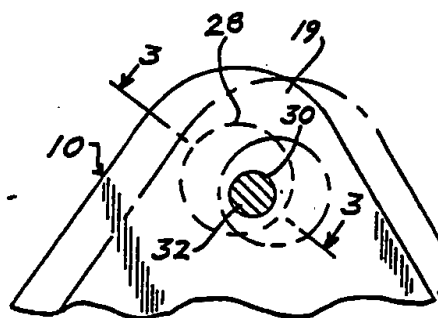


FIG. 2

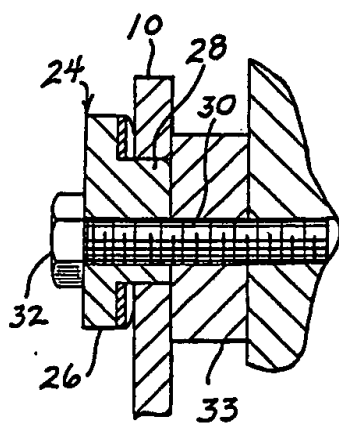


FIG. 3

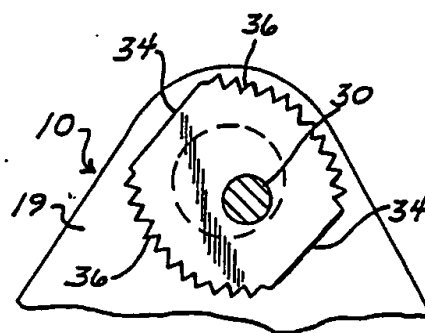



FIG. 4



# INTERNATIONAL SEARCH REPORT

International Application No PCT/US 88/02479

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) * According to International Patent Classification (IPC) or to both National Classification and IPC IPC4: F 02 M 19/12, F 02 D 11/04		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched ?		
Classification System	Classification Symbols	
IPC4	F 02 D; F 02 M; G 05 G; F 16 K	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched *		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	FR, A, 800472 (M. CHARLES RENE JODRY) 6 July 1936, see page 3, column 1, line 27 - line 44; figures 9-12 <div style="text-align: center; margin-top: 20px;">-----</div>	1
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents: <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search 15th December 1988		Date of Mailing of this International Search Report <div style="text-align: center; font-weight: bold; font-size: 1.2em;">83 JAN 1989</div>
International Searching Authority <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div>		Signature of Authorized Officer <div style="text-align: center;">   <b>P.C.G. VAN DER PUTTEN</b> </div>

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A- 800472	06/07/36	NONE	

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